

Appl. No.: 10/525,903

Amdt. Dated August 20, 2007

Response to Office Action Mailed April 20, 2007

## **AMENDMENTS TO THE CLAIMS:**

**This listing of claims will replace all prior versions and listings of claims in this application.**

1-27. (Cancelled).

28. (New) An optical modulator comprising  
a substrate comprised of a material having an electro-optic effect,  
an optical waveguide formed on said substrate, and  
a modulating electrode for allowing an electric field to work on said optical waveguide,  
and changing a phase of light passing through said optical waveguide,  
wherein said optical waveguide is a Mach-Zehnder type optical waveguide,  
stray light rejection means is provided on a surface of said substrate and at least one part  
of said stray light projection means is disposed between the optical waveguide active part, where  
the electric field of said modulating electrode works on the optical waveguide, and the substrate's  
side face near said optical waveguide active part.

29. (New) The optical modulator according to claim 28, wherein  
said stray light rejection means comprises a stray light rejection groove, which is formed  
on the surface of said substrate, and at least one part of which is formed adjacent to said optical  
waveguide.

30. (New) The optical modulator according to claim 29, wherein a distance between said stray light rejection groove and said optical waveguide is 10 to 100  $\mu\text{m}$  at closest.

31. (New) The optical modulator according to claim 29, wherein depth of said stray light rejection groove is almost the same as or is more than depth of said optical waveguide.

32. (New) The optical modulator according to claim 29, wherein said stray light rejection groove is filled with a light absorbing material.

33. (New) An optical modulator comprising  
a substrate comprised of a material having an electro-optic effect,  
an optical waveguide formed on said substrate, and  
a modulating electrode for allowing an electric field to work on said optical waveguide,  
and changing a phase of light passing through said optical waveguide,  
wherein said optical waveguide is a Mach-Zehnder type optical waveguide, and  
in order to prevent stray light from entering the optical waveguide, a low refractive index area with a refractive index lower than that of said substrate is provided at surrounding area of the optical waveguide including an under portion and a side portion of the optical waveguide, which comprises at least the optical waveguide active part where the electric field of said modulating electrode works on the optical waveguide.

34. (New) The optical modulator according to claim 33, wherein  
said low refractive index area has a thickness greater than a depth of said optical waveguide in a thickness direction of the substrate from a surface of said substrate, and  
a refractive index between a deepest part of said low refractive index area and a reverse face of said substrate is higher than the refractive index of said low refractive index area.

35. (New) The optical modulator according to claim 33, wherein said low refractive index area is formed by diffusion of a low refractive index material having a refractive index lower than that of said substrate, over said substrate.

36. (New) The optical modulator according to claim 35, wherein said low refractive index area comprises MgO or ZnO as the low refractive index material.

37. (New) The optical modulator according to claim 28, wherein antireflection treatment is given on a reverse face or a side face of said substrate.

38. (New) The optical modulator according to claim 28, wherein the frequency of modulation drive is more than 40 GHz.

39. (New) The optical modulator according to claim 28, wherein input power of light input into said optical waveguide element is more than 10mW.

40. (New) The optical modulator according to claim 30, wherein depth of said stray light rejection groove is almost the same as or is more than depth of said optical waveguide.

41. (New) The optical modulator according to claim 30, wherein said stray light rejection groove is filled with a light absorbing material.

42. (New) The optical modulator according to claim 33, wherein antireflection treatment is given on a reverse face or a side face of said substrate.

43. (New) The optical modulator according to claim 33, wherein the frequency of modulation drive is more than 40 GHz.

44. (New) The optical modulator according to claim 33, wherein input power of light input into said optical waveguide element is more than 10mW.